

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

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1. A mail edge biasing machine for sorting stacks of products in a homogenous orientation, comprising:
- 3 a plurality of compartments;
- 4 a plurality of moveable plates associated with each of the plurality
- 5 of compartments; and
- 6 a stationary feed head mechanism positioned proximate a central
- 7 compartment of the plurality of compartments, the feed head mechanism
- 8 being capable of transporting the products from the central compartment
- 9 to remaining compartments of the plurality of compartments,
- 10 wherein the feed head mechanism allows arrangement of products
- 11 transported to the remaining compartments to be each stacked proximate
- 12 the moveable plates and oriented with bound edges in the homogenous
- 13 orientation.
- 1 2. The mail edge biasing machine of claim 1, wherein the feed
- 2 head mechanism separately transports each of the products from the
- 3 central compartment to the remaining compartments.
- 1 3. The mail edge biasing machine of claim 1, wherein the central
- 2 moveable plate supports the products which have bound edges oriented in
- 3 opposing directions.

1 4. The mail edge biasing machine of claim 1, wherein the plurality
2 of compartments includes the central compartment and opposing side
3 compartments.

1 5. The mail edge biasing machine of claim 1, wherein the feed
2 head mechanism comprises:
3 a belt driven transportation mechanism having a plurality of
4 suction ports; and
5 a vacuum source in communication with the plurality of suction
6 ports.

1 6. The mail edge biasing machine of claim 5, wherein the belt
2 driven transportation mechanism is three belt driven transportation
3 mechanisms adapted to transport the stack of products in opposing
4 directions from the central compartment to the remaining compartments
5 which are opposing side compartments.

1 7. The mail edge biasing machine of claim 6, wherein the vacuum
2 source, via the plurality of suction ports, moves a product of the stack of
3 products from the central compartment for transportation to either of the
4 opposing side compartments.

1 8. The mail edge biasing machine of claim 1, further comprising
2 moveable walls separating each of the plurality of compartments.

1 9. The mail edge biasing machine of claim 1, further comprising a
2 plurality of belt drives for incrementally moving the plurality of moveable
3 plates and the stacks of products.

1 10. The mail edge biasing machine of claim 1, further
2 comprising a plurality of bottom elevator type moving systems for
3 incrementally moving the plurality of moveable plates and the stacks of
4 products, and which allows tops of the stacks of products to remain in a
5 fixed plane relative to the feed head mechanism.

1 11. The mail edge biasing machine of claim 1, wherein the feed
2 head mechanism includes an optical edge recognition system for detecting
3 a bound edge of the product.

1 12. The mail edge biasing machine of claim 11, wherein
2 information received from the optical edge recognition system is used for
3 separately transporting products of the stack of products from the central
4 compartment to the remaining compartments which are opposing side
5 compartments, thereby orienting the stack of products on each of the
6 opposing side compartments with bound edges in the homogenous
7 orientation.

1 13. A mail edge biasing system, comprising:
2 a general holding container divided into three separate
3 compartments;
4 opposing moveable guide walls separating the three separate
5 compartments;

6 moveable plates associated with each of the three separate
7 compartments, the moveable plates being adapted to move in either a first
8 direction or a second direction;

9 a feed head mechanism positioned over a central compartment of
10 the three separate compartments, the feed head mechanism including:

11 an optical edge recognition system for recognizing
12 differences in bound and non-bound edges of the products; and

13 a movement mechanism for moving products positioned
14 proximate a central moveable plate from the central compartment to
15 opposing side compartments of the three separate compartments based on
16 the recognition of the bound and non-bound edges of the products.

1 14. The mail edge biasing system of claim 12, wherein the
2 movement mechanism is two belt driven systems and each of the two belt
3 driven systems includes a plurality of suctioning ports for moving or
4 elevating the products positioned proximate the central moveable plate.

1 15. The mail edge biasing system of claim 14, wherein the two
2 belt driven systems are designed to move the products from the central
3 compartment to the opposing side compartments based on the information
4 received from the optical edge recognition system.

1 16. The mail edge biasing system of claim 13, further comprising
2 a belt driven system for moving the moveable plates, wherein a central
3 moveable plate is incrementally moveable towards the head feed
4 mechanism and opposing side moveable plates are incrementally
5 moveable away from the feed head mechanism.

1 17. A method of orienting a stack of products in a same direction,
2 comprising the steps of:
3 providing a stack of products in a central compartment;
4 incrementally moving the stack of products in the central
5 compartment towards a feed head mechanism;
6 detecting a difference between edges of a top product of the stack
7 of products; and
8 transporting the top product to one of two side compartments based
9 on the detecting step,
10 wherein all products transported to a first of the two side
11 compartments are oriented in a first same direction and all products
12 transported to a second of the two side compartments are oriented in a
13 second same direction.

1 18. The method of claim 17, further comprising repeating the
2 steps of claim 17 until the stack of products in the central compartment is
3 depleted.

1 19. The method of claim 17, wherein the product is elevated by
2 the feed head mechanism.

1 20. The method of claim 17, wherein the detecting step is based on a difference
2 in thickness between the edges to determine a bound edge and a non bound edge of the
3 top product.

1 21. The method of claim 17, wherein the transporting step includes elevating the
2 top product.

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